FACT SHEET

as required by LAC 33:IX.3109 for **major** LPDES facilities, for draft **Louisiana Pollutant Discharge Elimination System Permit No. LA0032239; AI 8994; PER20080001** to discharge to waters of the **State of Louisiana** as per LAC 33:IX.2311.

The **permitting authority** for the Louisiana Pollutant Discharge Elimination System (LPDES) is:

Louisiana Department of Environmental Quality
Office of Environmental Services
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

I. THE APPLICANT IS:

United States Department of the Army
North Fort Polk Wastewater Treatment Plant
Attn: Director of Public Works
6661 Warrior Trail, Bldg 350 (Suite 230)
Fort Polk, LA 71459

II. PREPARED BY: Eura DeHart

DATE PREPARED: November 21, 2008

III. PERMIT ACTION: reissue LPDES permit LA0032239, AI 8994; PER20080001

LPDES application received: April 8, 2008

EPA has not retained enforcement authority.

LPDES permit issued: September 11, 2003
LPDES permit expires: September 30, 2008

IV. FACILITY INFORMATION:

A. The application is for the discharge of treated sanitary wastewater from a publicly owned treatment works serving the northern part of the Joint Readiness Training Center and Fort Polk, consisting of 1130 single-family units. The estimated population of North Fort Polk is 3,000 to 5,000, which fluctuates due to training rotations. The types of processes are related to an Army Post. Wastewater is produced from military activities and training operations, which include the use of showers, meal preparation, drinking water purification units, and water from oil/water separators.

B. The permit application does not indicate the receipt of industrial wastewater.

C. The facility is located on F Avenue in Fort Polk, Vernon Parish.

D. The treatment facility consists of a primary treatment including a bar screen, grit chamber, oil and grease removal and primary clarifier. Secondary biological treatment including a "roughing" trickling filter, extended aeration basin, secondary clarifier, chlorination and dechlorination. Sludge from the clarifiers is sent to aerobic digesters. Digested sludge is sent to sand drying beds. The sludge is disposed in a permitted landfill.

E. Outfall 001

Discharge Location: Latitude 31° 5' 47" North
Longitude 93° 10' 0" West

Description: treated sanitary wastewater

Design Capacity: 1.4 MGD

Type of Flow Measurement which the facility is currently using:
Overflow weir with totalizer

V. RECEIVING WATERS:

The discharge is into Whiskey Chitto Creek, thence into the Calcasieu River in segment 030501 of the Calcasieu River Basin. This segment is listed on the 303(d) list of impaired waterbodies.

The **critical low flow** (7Q10) of Whiskey Chitto Creek is 0.1 cfs.

The **hardness value** is 99.4 mg/l and the **fifteenth percentile value for TSS** is 9.5 mg/l.

The designated uses and degree of support for Segment 030501 of the Calcasieu River Basin are as indicated in the table below[1/]:

Overall Degree of Support for Segment 030501	Degree of Support of Each Use						
Partial	Primary Contact Recreation	Secondary Contact Recreation	Propagation of Fish & Wildlife	Outstanding Natural Resource Water	Drinking Water Supply	Shell fish Propagation	Agriculture
	Not Supported	Full	Full	N/A	N/A	N/A	N/A

[1/]The designated uses and degree of support for Segment 030501 of the Calcasieu River Basin are as indicated in LAC 33:IX.1123.C.3, Table (3) and the 2006 Water Quality Management Plan, Water Quality Inventory Integrated Report, Appendix A, respectively.

VI. ENDANGERED SPECIES:

The receiving waterbody, Subsegment 030501 of the Calcasieu River Basin, is not listed in Section II.2 of the Implementation Strategy as requiring consultation with the U. S. Fish and Wildlife Service (FWS). This strategy was submitted with a letter dated October 27, 2007 from Boggs (FWS) to Brown (LDEQ). Therefore, in accordance with the Memorandum of Understanding between the LDEQ and the FWS, no further informal (Section 7, Endangered Species Act) consultation is required. It was determined that the issuance of the LPDES permit is not likely to have an adverse effect on any endangered or candidate species or the critical habitat. The effluent limitations established in the permit ensure protection of aquatic life and maintenance of the receiving water as aquatic habitat.

VII. HISTORIC SITES:

The discharge is from an existing facility location, which does not include an expansion beyond the existing perimeter. Therefore, there should be no potential effect to sites or properties on or eligible for listing on the National Register of Historic Places, and in accordance with the 'Memorandum of Understanding for the Protection of Historic Properties in Louisiana Regarding LPDES Permits' no consultation with the Louisiana State Historic Preservation Officer is required.

VIII. PUBLIC NOTICE:

Upon publication of the public notice, a public comment period shall begin on the date of publication and last for at least 30 days thereafter. During this period, any interested persons may submit written comments on the draft permit and may request a public hearing to clarify issues involved in the permit decision at this Office's address on the first page of the statement of basis. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

Public notice published in:

Local newspaper of general circulation

Office of Environmental Services Public Notice Mailing List

For additional information, contact:

Mr. Eura DeHart
Water Permits Division
Department of Environmental Quality
Office of Environmental Services
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

IX. PROPOSED PERMIT LIMITS:

Subsegment 030301, Whiskey Chitto Creek, Headwaters to southern boundary of Fort Polk Military Reservation, is listed on LDEQ's Final 2006 303(d) List as impaired for total fecal coliform (EPA – Category 5). To date no TMDLs have been completed for this waterbody. A reopener clause will be established in the permit to allow for the requirement of more stringent effluent limitations and requirements as imposed by a TMDL.

Fecal Coliform

To protect the receiving waterbody against high levels of pathogenic organisms, fecal coliform limitations have been established in the permit.

Interim Effluent Limits:

OUTFALL 001

Interim limits shall become effective on the effective date of the permit and expire three years after the effective date of the permit.

Effluent Characteristic	Monthly Avg. (lbs./day)	Monthly Avg.	Weekly Avg.	Basis
$CBOD_5$	117	10 mg/l	15 mg/l	Limits are set in accordance with the Statewide Sanitary Effluent Limitations Policy (SSELP) for facilities of this treatment type and size.
TSS	175	15 mg/l	23 mg/l	Since there is no numeric water quality criterion for TSS, and in accordance with the current Water Quality Management Plan, the TSS effluent limitations shall be based on a case-by-case evaluation of the treatment technology being utilized at a facility. Therefore, a Technology Based Limit has been established through Best Professional Judgement for the type of treatment technology utilized at this facility.
Oil and Grease	---	---	15 mg/l	Limits are based on the Anti-backsliding provision, which prohibits the renewal of a permit that contains effluent limits less stringent than those established in the previous permit.
Ammonia-Nitrogen	47	4 mg/l	8 mg/l	Limits are based on the Anti-backsliding provision, which prohibits the renewal of a permit that contains effluent limits less stringent than those established in the previous permit.

*Concentration limits are used in accordance with LAC 33:IX.2709.F.1.b which states that mass limitations are not necessary when applicable standards and limitations are expressed in other units of measurement. LAC 33:IX.709.B references LAC 33:IX.711 which express BOD_5 and TSS in terms of concentration.

Priority Pollutants

Effluent Characteristics	Monthly Avg. (lbs./day)	Daily Maximum (lbs./day)	Basis
Total Copper	Report	Report	Water Quality Based Limit

The above draft priority pollutants limit(s) for Total Copper is based upon the evaluation of one effluent analyses. The permittee may conduct and submit the results of three (3) or more additional effluent analyses to either refute or substantiate the presence of the above toxic pollutants. The additional analyses will be evaluated by this Office to determine if the pollutant is potentially in the effluent and if it potentially exceeds the State's water quality standards.

Final Effluent Limits:

OUTFALL 001

Final limits shall become effective three years after the effective date of the permit and expire on the expiration date of the permit.

Effluent Characteristic	Monthly Avg. (lbs./day)	Monthly Avg.	Weekly Avg.	Basis
$CBOD_5$	117	10 mg/l	15 mg/l	Limits are set in accordance with the Statewide Sanitary Effluent Limitations Policy (SSELP) for facilities of this treatment type and size.
TSS	175	15 mg/l	23 mg/l	Since there is no numeric water quality criterion for TSS, and in accordance with the current Water Quality Management Plan, the TSS effluent limitations shall be based on a case-by-case evaluation of the treatment technology being utilized at a facility. Therefore, a Technology Based Limit has been established through Best Professional Judgement for the type of treatment technology utilized at this facility.

Effluent Characteristic	Monthly Avg. (lbs./day)	Monthly Avg*	Weekly Avg	Basis
Oil and Grease	---	---	15 mg/l	Limits are based on the Anti-backsliding provision, which prohibits the renewal of a permit that contains effluent limits less stringent than those established in the previous permit.
Ammonia-Nitrogen	47	4 mg/l	8 mg/l	Limits are based on the Anti-backsliding provision, which prohibits the renewal of a permit that contains effluent limits less stringent than those established in the previous permit.

*Concentration limits are used in accordance with LAC 33:IX.2709.F.1.b which states that mass limitations are not necessary when applicable standards and limitations are expressed in other units of measurement. LAC 33:IX.709.B references LAC 33:IX.711 which express BOD_5 and TSS in terms of concentration.

Priority Pollutants

Effluent Characteristics	Monthly Avg. (lbs./day)	Daily Maximum (lbs./day)	Basis
Total Copper	0.26	0.61	Water Quality Based Limit

The above draft priority pollutants limit(s) for Total Copper is based upon the evaluation of **one** effluent analyses. The permittee may conduct and submit the results of three (3) or more additional effluent analyses to either refute or substantiate the presence of the above toxic pollutants. The additional analyses will be evaluated by this Office to determine if the pollutant is potentially in the effluent and if it potentially exceeds the State's water quality standards.

Other Effluent Limitations:

1) **Fecal Coliform**

The discharge from this facility is into a water body which has a designated use of Primary Contact Recreation. According to LAC 33:IX.1113.C.5.b.i, the fecal coliform standards for this water body are 200/100 ml and 400/100 ml. Therefore, the limits of 200/100 ml (Monthly Average) and 400/100 ml (Daily Max) are proposed as Fecal Coliform limits in the permit. These limits are being proposed through Best Professional Judgement in order to ensure that the water body standards are not exceeded, and due to the fact that existing facilities have demonstrated an ability to comply with these limitations using present available technology.

2) **pH**

According to LAC 33:IX.3705.A.1., POTW's must treat to at least secondary levels. Therefore, in accordance with LAC 33:IX.5905.C., the pH shall not be less than 6.0 standard units nor greater than 9.0 standard units at any time.

3) Solids and Foam

There shall be no discharge of floating solids or visible foam in other than trace amounts in accordance with LAC 33:IX.1113.B.7.

4) Toxicity Characteristics

In accordance with EPA's Region 6 Post-Third Round Toxics Strategy, permits issued to treatment works treating domestic wastewater with a flow (design or expected) greater than or equal to 1 MGD shall require biomonitoring at some frequency for the life of the permit or where available data show reasonable potential to cause lethality, the permit shall require a whole effluent toxicity (WET) limit (*Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards*, April 16, 2008, Version 6).

Whole effluent biomonitoring is the most direct measure of potential toxicity which incorporates the effects of synergism of the effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity. LAC 33:IX.1121.B.3. provides for the use of biomonitoring to monitor the effluent for protection of State waters. The biomonitoring procedures stipulated as a condition of this permit are as follows:

The permittee shall submit the results of any biomonitoring testings performed in accordance with the LPDES Permit No. LA0032239, **Biomonitoring Section** for the organisms indicated below.

TOXICITY TESTS	FREQUENCY
Chronic static renewal 7-day definitive test using Ceriodaphnia dubia	1/quarter
Chronic static renewal 7-day definitive test using Pimephales promelas	1/quarter

Dilution Series - The permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests. These additional concentrations shall be 30%, 40%, 54%, 72%, and 96%. The critical biomonitoring dilution and WET limit is defined as 96% effluent. The critical dilution is calculated in Appendix B-1 of this fact sheet. Results of all dilutions shall be documented in a full report according to the test method publication mentioned in the **Biomonitoring Section** under Whole Effluent Toxicity. This full report shall be submitted to the Office of Environmental Compliance as contained in the Reporting Paragraph located in the **Biomonitoring Section** of the permit.

A reasonable potential analysis was conducted which demonstrated a finding of reasonable potential for lethal and sub-lethal toxicity based on the last five years of reported biomonitoring testing data. However, this facility is currently undergoing a voluntary TRE in an attempt to find the source(s) of lethal and sub-lethal toxicity. All biomonitoring requirements of the existing permit are currently being met. LDEQ is promptly notified by the facility of any unusual circumstances that may affect the facility's biomonitoring testing or TRE progress. For these reasons, LDEQ does not recommend a Whole Effluent Toxicity (WET) Limit be implemented immediately upon permit reissuance. Rather, LDEQ recommends that a three year compliance schedule be incorporated into LA0032239. The purpose of this compliance schedule is to attain compliance with the WET limit. After this three year period expires, the WET limit stated in Part I of LA0032239 shall become effective.

The permit may be reopened to require effluent limits, additional testing, and/or other appropriate actions to address toxicity if biomonitoring data show actual or potential ambient toxicity to be the result of the permittee's discharge to the receiving stream or water body. Modification or revocation of the permit is subject to the provisions of LAC 33:IX.2383. Accelerated or intensified toxicity testing may be required in accordance with Section 308 of the Clean Water Act.

5) Total Residual Chlorine

If chlorination is used to achieve the limitations on Fecal Coliform Bacteria, the effluent shall contain NO MEASUREABLE Total Residual Chlorine (TRC) after disinfection and prior to disposal. Given the current constraints pertaining to chlorine analytical methods, NO MEASUREABLE will be defined as less than 0.1 mg/l of chlorine. The TRC shall be monitored 2/week by grab sample.

X. PREVIOUS PERMITS:

LPDES Permit No. LA0032239: Issued: September 11, 2003
Expired: September 30, 2008

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Monthly Avg.	Weekly Avg.	Measurement Frequency	Sample Type
Flow	Report	Report	Continuous	Recorder
$CBOD_5$	10 mg/l	15 mg/l	2/week	6 Hr. Composite
TSS	15 mg/l	23 mg/l	2/week	6 Hr. Composite
Total Residual Chlorine	No measurable	No measurable	2/week	Grab
Ammonia-Nitrogen	4 mg/l	8 mg/l	2/week	6 Hr. Composite
Oil & Grease	---	15 mg/l	2/week	Grab
Fecal Coliform Colonies	200	400	2/week	6 Hr. Composite
pH	6.0 (min)	9.0(max)	2/week	Grab

The permit contains biomonitoring.
The permit contains pollution prevention language.

XI. ENFORCEMENT AND SURVEILLANCE ACTIONS:

A) Inspections

A review of the files indicates the most recent inspection of this facility was performed on October 4, 2007. The following observations were made:

- Reviewed records and DMRs from Jan. 2006 to Aug. 2007
- Numerous permit excursions noted
- TRE for biomonitoring initiated
- Facility believes problem was with residual Cl_2 at the outfall
- Lab audit with Sheilla Guzman, Amy Prausa and Christina Baker
- Reviewed bench logs for $CBOD_5$, TSS, Oil & Grease and fecal coliform
- Bubbles present in one of the samples in the incubator
- Site review conducted with James Byrd & Tom Duck
- Effluent was light brown, clear, small amount of suspended solids and no odor
- Some samples collected inside chlorine contact changer and dechlorination chamber
- Operators are not conducting general routine operating monitoring to ensure the plant is operating efficiently
- There was an overflow at a junction box between the grinder and grease chamber

- The sample collection tubing for the automatic compositor was not in the wastewater to collect a representative sample
- The automatic compositor has no NIST certified thermometer
- Seal leak on pump sending wastewater from the clarifier to the chlorine contact chamber; wastewater flowing onto ground
- Leachate from sold waste scrapped from bar screen was running onto ground
- Trickle filter's center seal was leaking and dispersers need cleaning
- Two air diffusers in aeration basin were not operating properly
- Dried sludge was left on the ground outside of the drying beds where it could commingle with stormwater and be discharged

B) Compliance and/or Administrative Orders

A review of the files indicates that a Consolidated Compliance Order & Notice of Potential Penalty (Enforcement Tracking No. WE-CN-07-0393) was issued to the facility on November 26, 2007 for violations observed during the October 4, 2007 inspection, permit excursions reported on DMRs, overflows reported by the facility, failure to submit biomonitoring results on DMRs, and failure to submit complete and/or accurate DMRs.

C) DMR Review

A review of the discharge monitoring reports for the period beginning June 1, 2006 through May 31, 2008 has revealed the following violations:

Parameter	Outfall	Period of Excursion	Permit Limit	Reported Quantity
Ammonia, Weekly Avg.	001	August 2006	8 mg/l	10.4 mg/l
CBOD, Loading	001	March 2007	117 lbs/day	124 lbs/day
CBOD, Monthly Avg.	001	March 2007	10 mg/l	17 mg/l
CBOD, Weekly Avg.	001	March 2007	15 mg/l	35 mg/l
TRC	001	April 2007	0.099 mg/l	0.13 mg/l
CBOD, Monthly Avg.	001	April 2007	10 mg/l	15 mg/l
CBOD, Weekly Avg.	001	April 2007	15 mg/l	37 mg/l
Ammonia, Monthly Avg.	001	May 2007	4.0 mg/l	4.1 mg/l
CBOD, Monthly Avg.	001	May 2007	10 mg/l	10.2 mg/l
TSS, Weekly Avg.	001	March 2008	23 mg/l	34 mg/l
Ammonia, Monthly Avg.	001	March 2008	4.0 mg/l	5.2 mg/l
CBOD, Monthly Avg.	001	April 2008	10 mg/l	17.4 mg/l
CBOD, Weekly Avg.	001	April 2008	15 mg/l	42.3 mg/l
Fecal Coliform, Weekly Avg.	001	April 2008	400/100 ml	673/100 ml
CBOD, Weekly Avg.	001	May 2008	15 mg/l	20.0 mg/l
TSS, Weekly Avg.	001	May 2008	23 mg/l	36.0 mg/l
Ammonia, Monthly Avg.	001	May 2008	4 mg/l	5.6 mg/l
Ammonia, Weekly Avg.	001	May 2008	8 mg/l	9.0 mg/l

XII. ADDITIONAL INFORMATION:

In accordance with LAC 33:IX.2707.C, this permit may be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitations issued or approved under sections 301(b)(2)(c) and (D); 304(b)(2); and 307(a)(2) of the Clean Water Act, if the effluent standard or limitations so issued or approved:

a) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

b) Controls any pollutant not limited in the permit; or

c) Requires reassessment due to change in 303(d) status of waterbody; or

d) Incorporates the results of any total maximum daily load allocation, which may be approved for the receiving water body. The Department of Environmental Quality reserves the right to impose more stringent discharge limitations and/or additional restrictions as a result of the TMDL. Therefore, prior to upgrading or expanding this facility, the permittee should contact the Department to determine the status of the work being done to establish future effluent limitations and additional permit conditions.

Final effluent loadings (i.e. lbs/day) have been established based upon the permit limit concentrations and the design capacity of 1.4 MGD.
Effluent loadings are calculated using the following example:

BOD: 8.34 lb/gal x 1.4 MGD x 10 mg/l = 117 lbs/day

At present, the **Monitoring Requirements, Sample Types, and Frequency of Sampling** as shown in the permit are standard for facilities of flows between **1.00** and **5.00** MGD.

Effluent Characteristics	Monitoring Requirements	
	Measurement Frequency	Sample Type
Flow	Continuous	Recorder
BOD_5	2/week	6 Hr. Composite
Total Suspended Solids	2/week	6 Hr. Composite
Ammonia-Nitrogen	2/week	6 Hr. Composite
Dissolved Oxygen	2/week	Grab
Fecal Coliform Bacteria	2/week	Grab
pH	2/week	Grab
Biomonitoring		
Ceriodaphnia dubia	1/quarter	24 Hr. Composite
Pimephales promelas	1/quarter	24 Hr. Composite

Compliance Schedule
Interim limits are proposed for this facility to allow the facility time to achieve compliance with the total copper limitation and the WET limit for biomonitoring.

The permittee shall achieve compliance with the FINAL EFFLUENT LIMITATIONS and MONITORING REQUIREMENTS as specified in accordance with the following schedule:

ACTIVITY	DATE
Achieve Interim Effluent Limitations and Monitoring Requirements	Effective date of permit
Achieve Final Effluent Limitations and Monitoring Requirements	3 years from the effective date of the permit

The permittee shall achieve compliance with the final effluent limitations specified for Total Copper within three years of the effective date of this permit

The permittee shall initiate and continue ongoing activities designed to achieve sustained compliance with final effluent limitations for Total Copper no later than three years after the effective date of this permit.

The permittee shall submit a progress report outlining the status of the activities on a yearly basis (from the effective date of the permit) until compliance is achieved.

No later than fourteen calendar days following the date for compliance for Total Copper, the permittee shall submit a written notice of compliance or noncompliance.

During the Draft Permit comment period, the permittee may conduct and submit the results of three (3) or more additional effluent analyses to either refute or substantiate the presence of the toxic pollutant(s) limited in the Draft Permit. The additional analyses will be evaluated by this Office to determine if the pollutant(s) is/are potentially in the effluent and if it/they potentially exceed the State's water quality standards.

Pretreatment Requirements

Based upon consultation with LDEQ pretreatment personnel, general pretreatment language will be used due to the lack of either an approved or required pretreatment program.

Pollution Prevention Requirements

The permittee shall institute or continue programs directed towards pollution prevention. The permittee shall institute or continue programs to improve the operating efficiency and extend the useful life of the facility. The permittee will complete an annual Environmental Audit Report **each year** for the life of this permit according to the schedule below. The permittee will accomplish this requirement by completing an Environmental Audit Form which has been attached to the permit. All other requirements of the Municipal Wastewater Pollution Prevention Program are contained in Part II of the permit.

The audit evaluation period is as follows:

Audit Period Begins	Audit Period Ends	Audit Report Completion Date
Effective Date of Permit	12 Months from Audit Period Beginning Date	3 Months from Audit Period Ending Date

Environmental Impact Questionnaire:

Applicant Comments/Responses (verbatim from applicant)

1. Have the potential and real adverse effects of the proposed facility been avoided to the maximum extent possible?

   N/A Existing facility not requesting a major modification.

2. Does a cost benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed facility demonstrate that the latter outweighs the former?

N/A Existing facility not requesting a major modification.

3. Are there alternative projects which would offer more protection to the environment than the proposed facility without unduly curtailing nonenvironmental benefits?

   N/A Existing facility not requesting a major modification.

4. Are there alternative sites which would offer more protection to the environment than the proposed facility site without unduly curtailing nonenvironmental benefits?

   N/A Existing facility not requesting a major modification.

5. Are there mitigating measures which would offer more protection to the environment than the facility as proposed without unduly curtailing nonenvironmental benefits?

   N/A Existing facility not requesting a major modification.

XIII. TENTATIVE DETERMINATION:

On the basis of preliminary staff review, the Department of Environmental Quality has made a tentative determination to reissue a permit for the discharge described in this Statement of Basis.

XIV. REFERENCES:

Louisiana Water Quality Management Plan / Continuing Planning Process, Vol. 8, "Wasteload Allocations / Total Maximum Daily Loads and Effluent Limitations Policy," Louisiana Department of Environmental Quality, 2005.

Louisiana Water Quality Management Plan / Continuing Planning Process, Vol. 5, "Water Quality Inventory Section 305(b) Report," Louisiana Department of Environmental Quality, 1998.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Chapter 11 - "Louisiana Surface Water Quality Standards," Louisiana Department of Environmental Quality, 2004.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Subpart 2 - "The LPDES Program," Louisiana Department of Environmental Quality, 2004.

Low-Flow Characteristics of Louisiana Streams, Water Resources Technical Report No. 22, United States Department of the Interior, Geological Survey, 1980.

Index to Surface Water Data in Louisiana, Water Resources Basic Records Report No. 17, United States Department of the Interior, Geological Survey, 1989.

LPDES Permit Application to Discharge Wastewater, United States Department of the Army, North Fort Polk Wastewater Treatment Plant, April 8, 2008.

APPENDIX I

Numeric Toxic Limits: LDEQ has reviewed and evaluated the effluent analyses submitted by the permittee on April 8, 2008 and July 21, 2008, and examined the following pollutants that are regulated by LAC 33:IX.1113.C.6. in accordance with the implementation procedures outlined under the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, April 16, 2008. Please see Appendix B-1, Water Quality Screen Spreadsheet.

Pollutant	Ce [1]	Ce x 2.13 [2]	Water Quality Based Limit [3]	Drinking Water Source	Permit Limit ?
Copper	32.0 µg/L	68.16 µg/L	0.2583 lbs/day	-----	YES
Zinc	22.0 µg/L	46.86 µg/L	1.9350 lbs/day	-----	NO

1/ Metals concentration results were presented as total metals in lab analysis submitted by the permittee. All pollutants calculated in µg/l.

2/ For the reported effluent concentrations (Ce) it is estimated that 95% of the concentrations of chemicals taken over time will be 2.13 times the Ce or less.

3/ The water quality based limit is the maximum allowable instream concentration for that pollutant to be in compliance with water quality standards. Louisiana Water Quality Criteria for metals are hardness dependent, and expressed as dissolved metals. The water quality based limit is calculated with a conversion for metals limits expressed as total metals.

The following steps were used in evaluating the potential toxicity of the analyzed pollutants (see Appendix B-1):

i. An evaluation of the applicability of the effluent data.

Results of the PPS were entered and compared to EPA's Minimum Quantification Levels (MQL's) to determine the potential presence of the respective toxic pollutant. Those pollutants with reported laboratory Method Detection Levels (MDL's) which exceed their respective EPA MQL's are determined to be reasonably present in the effluent and an evaluation of their potential toxicity is determined. Those pollutants with MDLs less than the MQL are determined to be not potentially present in the effluent and eliminated from further evaluation.

ii. Calculation of permit limits based on applicable water quality standards.

Applicable water quality criteria are listed in the Appendix B-1 in Columns 12-14. These values were used to calculate the Waste Load Allocations (WLAs) for each of the toxic pollutants. The WLA is the maximum allowable concentration of a pollutant necessary to meet the respective water quality criteria. The WLAs are calculated as described in the State's Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, dated April 16, 2008, as follows (**Copper** is used as the example pollutant for the following calculations):

Complete Mix Balance Model for Waste Load Allocation

Qe = plant effluent, MGD = **1.4**
Qr = critical flow of receiving stream, **0.1 cfs**
Fs = MZ, ZID flow fraction, LAC 33:IX.1115.D.7 and 8 (**MZ = 1, and ZID = 0.1**)
Cr = numerical criteria value from LAC 33:IX.1113, Table 1
Cu = ambient instream concentration for pollutant. In the absence of accurate supporting data, assume Cu = 0
WLA = concentration for pollutant at end-of-pipe based on aquatic life and human health numerical criteria (site specific dilution type)
LTA = long term average, units same as WLA
WQBL = effluent water quality based limit.

Dilution factor $= \frac{Qe}{(QrFs + Qe)}$

Dilution factor (acute) $= \frac{1.4}{(0.1)(0.6463)(0.1) + 1.4}$

$= 0.996$

Dilution factor (chronic) $= \frac{1.4}{(0.1)(0.6463)(1.0) + 1.4}$

$= 0.956$

WLA = (Cr/Dilution factor) - (FsQrCu/Qe)

iii. Conversion of dissolved metals criteria for aquatic life to total metals.

Metals criteria for aquatic life protection are based on dissolved metals concentrations and hardness values averaged from data compilations contained in the Louisiana Water Quality Data Summary. A dissolved to total metal conversion will be implemented. Hardness and TSS are a function of the conversion. This involves determining a linear partition coefficient for the metal of concern and using this to determine the fraction of metal dissolved, so that the dissolved metal ambient criteria may be translated to a total effluent limit. The average hardness value used for the analysis is **99.4 mg/l CaCO3** (USGS data). The 15th percentile TSS value is **9.5 mg/l**. The formula for converting dissolved metals to total metals for streams and lakes are provided below.

K_p = Linear partition coefficient
K_{po} = found in Table A below
α = found in Table A below
TSS = total suspended solids concentration found in receiving stream or approximation thereof (nearest most representative site), lowest 15th percentile, units in mg/l
C_D/C_T = Fraction of metal dissolved
Cr = Dissolved criteria value for metal in water quality standards

$\mathbf{K_p = K_{po} \times TSS^{\alpha}}$

$K_p = (1.04 \times 10^6) \times 9.5^{(-0.74)}$

then, $\frac{C_D}{C_T} = \frac{1}{1 + (K_P)(TSS)(10^{-6})}$

$\frac{C_D}{C_T} = \frac{1}{1 + (196{,}570.29)(9.5)(10^{-6})}$

$= 0.35$

therefore,

$$\text{Total Metal} = \frac{Cr}{(C_D/C_T)}$$

TABLE A

LINEAR PARTITION COEFFICIENTS
FOR PRIORITY METALS IN STREAMS AND LAKES

(Delos et. al, 1984) (*1)

METAL	STREAMS		LAKES	
	K_{po}	α	K_{po}	α
Arsenic	0.48×10^6	-0.73	0.48×10^6	-0.73
Cadmium	4.00×10^6	-1.13	3.52×10^6	-0.92
Chromium III (*2)	3.36×10^6	-0.93	2.17×10^6	-0.27
Copper	1.04×10^6	-0.74	2.85×10^5	-0.9
Lead	2.80×10^6	-0.8	2.04×10^6	-0.53
Mercury	2.90×10^6	-1.14	1.97×10^6	-1.17
Nickel	0.49×10^6	-0.57	2.21×10^6	-0.76
Zinc	1.25×10^6	-0.7	3.34×10^6	-0.68

(*1) Delos, C. G., W. L. Richardson, J. V. DePinto, R. B. Ambrose, P. W. Rogers, K. Rygwelski, J. P. St. John, W. J. Shaughnessey, T. A. Faha, W. N. Christie. Technical Guidance for performing Waste Load Allocations, Book II: Streams and Rivers. Chapter 3: Toxic Substances, for the U. S. Environmental Protection Agency. (EPA-440/4-84-022).

(*2) Linear partition coefficients shall not apply to the Chromium VI numerical criterion. The approved analytical method for Chromium VI measures only the dissolved form. Therefore, permit limits for Chromium VI shall be expressed in the dissolved form. See 40 CFR 122.45(c)(3).

WLA a,c,h = (Cr/Dilution factor) - (FsQrCu/Qe)

WLA_{acute} = (52.64/0.996) - [(0.1)(0.872)(0)/1.4] = 58.85

$WLA_{chronic}$ = (34.93/0.956) - [(1.0)(0.872)(0)/1.4] = 36.54

iv. Calculation of Long Term Averages (LTA's) and Permit Limits.

Comparison of the reported effluent data (converted to the 95th percentile) to the calculated effluent limitations. Long term averages are listed in the Appendix B-1 in Columns 15-17.

Long term averages are calculated for each WLA (based on aquatic and human health criteria). The LTA's are calculated as follows:

$LTA_a = WLA_a \times 0.32$
$LTA_c = WLA_c \times 0.53$
$LTA_h = WLA_h$

LTA_{acute} = 52.85 x 0.32 = 16.91

$LTA_{chronic}$ = 36.54 x 0.53 = 19.37

A comparison of each LTA is made and the lowest (most restrictive) is selected to calculate the effluent limitations. The most limiting LTA is listed in Appendix B-1, Column 18.

Calculation of permit limits if aquatic life LTA is more limiting:

Daily Average = Min(LTA_a, LTA_c) x 1.31
Daily Maximum= Min(LTA_a, LTA_c) x 3.11

Daily Average = 16.91 x 1.31 = 22.15 μg/l
Daily Maximum = 16.91 x 3.11 = 52.59 μg/l

If human health LTA is more limiting:
Daily Average = LTA_h
Daily Maximum = LTA_h x 2.38

The resulting allowable effluent concentration is converted to a mass value using the following formula:

lbs/day = (0.02215 mg/l) x 8.34 x 1.4 MGD

= 0.259

Comparison of the reported effluent data (converted to 95th percentile) is made to the calculated effluent limitations. Water Quality Based limits are listed in Appendix B-1, Columns 19-22.

In accordance with the State of Louisiana's implementation procedures, the reported effluent concentration is compared to the calculated daily average concentration. If the effluent concentration is greater than the calculated daily average concentration, then a reasonable potential exists and an effluent limitation for the pollutant of concern is imposed in the permit. (Please refer to Appendix B-1 for the calculated daily average concentration listed in Column 19 and the effluent concentration listed in Column 3.)

The discharge is considered to pose a reasonable potential to cause a water quality excursion if the estimated 95th percentile of a pollutant in the effluent will result in an instream waste concentration, which is above the applicable State water quality criterion. The 95th percentile of possible effluent concentrations are estimated as follows:

$$C_{95} = C_{mean} * \exp(1.645 * \sigma - 0.5 * \sigma^2)$$

where: 1.645 = normal distribution factor at 95th percentile

$$\sigma^2 = \ln(CV^2 + 1)$$

if CV is assumed = 0.6,
$\sigma^2 = .307$

The ratio of the estimated 95th percentile value to the mean (C_{95}/C_{mean}) is calculated :

$$C_{95}/C_{mean} = 2.13$$

Based upon review of the permittee's effluent data, there is one pollutant present or potentially present in the effluent discharge in such concentrations which would cause an exceedance of Louisiana's Water Quality Standards. This pollutant is identified as total copper. A summary of the evaluation of the permittee's effluent analysis of the toxic pollutants is listed in Appendix B-1. As per LAC 33:IX.2709.F.1, all pollutants limited in permits shall have limitations, standards, or prohibitions expressed in terms of mass. Consequently, water quality-based limitations as seen in the permit are expressed in terms of mass.